SciVerse ScienceDirect

Procedia - Social and Behavioral Sciences 32 (2012) 288 – 295

Procedia Social and Behavioral Sciences

4th International Conference of Cognitive Science (ICCS 2011)

The relationship between incoherent speech and different types of delusions and hallucinations in schizophrenics with positive symptoms

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Abstract

The most important speech disorder in schizophrenic patients with positive symptoms is incoherency, which has a wide spectrum depending on various factors. The present paper examines the relationship between incoherency of speech, delusions and hallucinations by investigating the discourse characteristics of the spontaneous speech of 18 Persian-speaking schizophrenics with positive symptoms. Based on the analysis of the data, two types of delusions: variable (VD) and invariable (ID), and two types of hallucinations: synchronic (SH) and diachronic (DH) were identified, and their relationships were discussed. The findings reveal that there is a strong correlation between the incoherency of speech and VD in these patients, and VD itself seems to result from SH.

Keywords: Incoherency of Speech; Schizophrenia; Positive Symptoms; Variable/Invariable Delusion; Synchronic/Diachronic Hallucination

1. Introduction

Schizophrenia can be diagnosed through identifying the incoherency of speech in patients. The types of speech disorders in these patients depend on factors related to the classification of the disease itself. For instance, in both acute and chronic schizophrenia, the presence of positive or negative symptoms could cause different speech abnormalities. The present research aims to study the mutual relations between synchronic hallucination (SH) / diachronic hallucination (DH) and invariable delusion (ID) / variable delusion (VD), on the one hand, and between each of the two delusions and incoherency of speech, on the other, in schizophrenic patients with positive symptoms. This could help us to better analyze the speech performance of these patients, and to find out more profoundly about the factors underlying their incoherent speech. According to Bentall, Baker, and Havers (1991), Brebion, Gorman, Amador, Malaspina, and Sharif (2002), Brebion, David, Jones, and Pilowsky (2005) and Brunelin et al., (2008), some kinds of correlation can exist between hallucinations and delusions. However Costafreda,

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1877-0428 © 2011 Published by Elsevier Ltd. Selection and/or peer-review under responsibility of the 4th International Conference of Cognitive Science
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Brébion, Allen, McGuire, and Fu (2008) have not found any evidence indicating the existence of any relationship between these two variables in schizophrenic patients.

Hallucinations, delusion and thought disorder (TD) are considered as positive symptoms of schizophrenia. Bleuler (1911/1950) has described hallucination as comprehension without external stimulus. The main hallucinations are assumed to be associated with the senses, and can be visual, auditory (verbal), gustatory, olfactory and tactile. Apart from these five senses, affective senses may also be involved in affective hallucinations which may contain various contents such as grandeur, seeking, inferiority complex, guilt-feeling and so on. According to Frith (1992), the verbal hallucinations and other positive symptoms results from the external misattribution of internally generated events. The cognitive model of Frith, as mentioned by Pachoud (1997), presents three hypotheses: intentional deficit (intention of patients in speech act is basically weak), trouble in planning (intensification of automatic actions will lead to carelessness and neglect of the environment), and trouble of agentivity (patients are not initiators or subjects of their activities, and this leads to "influence syndrome", in which they feel that their acts are influenced by an internal force). Frith (1992, 2005) believes that trouble in agentivity results from the defect in action monitoring, a process through which one suddenly becomes aware of the current action and can monitor it, but in hallucination, self-generated verbal materials are experienced as originating from a non-self author. The monitoring process is a subcategory of source memory. According to Johnson, Hashtroudi, and Lindsey (1993), any deficit in this memory leads to failing the recalling of one's memory. The source memory includes monitoring to distinguish the events made by persons in their minds from what is occurring in the real world. Frith (1995) has found this deficit in schizophrenic patients with positive symptoms. According to Frith and Done (1998), a deficit in corollary discharge networks, which distinguishes self-generated perceptions from the external ones, provokes a defect in self-attribution, and therefore one attributes his/her activities to others. They argue that this deficiency generalizes to schizophrenic patients' inner speech. Keefe, Arnold, Bayen, and Harvey (1999) have also reported that schizophrenic patients tend to attribute their self–generated perceptions to an external source, because of the deficit in source monitoring. Therefore, the origin of speech problems among schizophrenic patients lies in the Theory of mind (Frith, 2004; Brune, 2005; Abu-Akel, 1999, 2008; Bright-Paul, Jarrold, & Wright 2008).

Another positive symptom is delusion, which is attributed to the special thoughts and beliefs of patients. These delusions lack a real basis, but the patients insist on their reality. Delusions are of various types, and differ in terms of their contents, but some, such as delusion of persecution and grandeur, are more common.

Thought disorder (TD) is another symptom of positive schizophrenia associated with language and speech disorders. At least, two types of verbal disorders have been identified with respect to TD: a) schizophasia, b) formal thought disorder (FTD). Schizophasia is not common among schizophrenic patients without negative symptoms. FTD is a disorder reflected at the discourse level, although, as Levy et al., (2009) propose, the semantic layer of language is involved in this disorder, because the patient does not use language with its usual meaning, but with the idiosyncratic one. Therefore, the meaning of utterances becomes vague and incoherent for the hearer. According to Rochester and Martin (1979), there is a cyclic relation between TD and incoherency, meaning that TD leads to incoherent speech and vice versa. The speech disorder, in turn, leads to communication disorder.

With respect to TD, which has been counted as the main factor giving rise to speech incoherency, some researchers have pointed to causes, such as loss of voluntary control (Chapman, 1966; Mellor, 1970; & Chaika, 1990), problems in semantic level (Chapman, Chapman, & Miller, 1964; Chapman and Chapman, 1973; Clemmer, 1980; Rodriguez-Ferrera, McCarthy, & McKenna, 2001; Oh, McCarthy, & McKenna, 2002), violation of discourse principles (Corcoran & Frith, 1996; Tényi, Herold, Szili, & Trixler, 2002; Linscott, 2004; Salmani, Bakhtiyari, & Raeisi, 2008), drop of cognitive abilities (McGrath, 1991; Pachoud, 1997; Linscott, 2004), such as poverty of planning ability (Costello & Warrington, 1989; Frith, 1992; Morris, Rushe, Woodruffe, & Murray, 1995; Berenbaum, Kerns, Vernon, & Gomez 2008), and deficit in working memory (Dochetry, DeRosa, & Andreasen, 1996; Barch & Berenbaum, 1997; Melinder & Barch, 2003).

Regarding the relationship between language and context, two main issues of cohesion and coherency are discussed in the literature, which, according to Halliday (1978), form the textuality of speech. Coherency is concerned with the way in which propositions are linked together in a logical and sequential manner, while cohesion signifies the surface ties, which link units together. A sequence of sentences may be cohesive without being coherent (Finch, 2000). Incoherency is the most basic disorder in positive schizophrenic speech. Bleuler (1950/1911) has introduced association disorder as one of the main traits of schizophrenia, in which the associations lose their sequence, and thoughts become illogical and odd, but not meaningless.

According to Givon (1995), coherency takes form not only in external text, but also as a cognitive phenomenon in mind that produces and comprehends the text. In coherency as a collaborative process, the minds of interlocutors are involved in attempting to simultaneously achieve many goals. However, achieving these goals is a matter of degree. Givon's opinion leads to the point whether coherency in mind and in context are coincided. The schizophrenic patients' speech performance can, in fact, be an indication that a person may have a coherent mental speech, but due to any reason, his/her speech may not be coherent.

2. Method

The subjects included 18 (9 male and 9 female) Persian-speaking individuals in acute stage meeting DSM-IV-TR criteria for schizophrenia with positive symptoms. They ranged from 18 to 56 years of age and their education level varied from illiterate to bachelor's level. These patients belonged to average or low class societies, and were hospitalized in Tehran's Razi and Rouzbeh mental hospitals. None of the individuals had a history of stroke, convulsion or addiction. Table 1 shows the subjects' general information.

Table 1. Demography of the Subjects

Gender	Male	9
	Female	9
Age group	18-28 yrs.	5
	29-39 yrs.	6
	40-50 yrs.	4
	51-56 yrs.	3
Marital status	Single	12
	Married	3
	Divorced	3
Education	Above diploma	5
	Diploma	4
	Guidance-high school	7
	Elementary school	1
	Illiterate	1

Without imposing specific limitations or planning for the topic or time of interview, the patients were interviewed individually. The examiner prompted a conversation on issues that would be interesting and would encourage them to produce sufficient outputs. The test sessions were conducted between 9:00-12:00 A.M. in a period of 3 weeks, at least twice for each patient.

The spontaneous speech of the patients was recorded and transcribed in order to be analyzed based on the linguistic factors of cohesion and coherence. Statistical calculations were carried out using Pearson's transverse tables (chi-square test), and the correlations were analyzed by spss-15 software.

For evaluating the cohesion of the speech, the improper deletions of surface nodes including the subjects of sentences, antecedents of the pronouns, definite nouns and proper nouns of each text were counted. The coherency was observed based on the Grice (1975) Principles: violation of the quality maxim by lacking necessary or giving excessive information; violation of the quantity maxim by answering based on hallucination in form of delusion or illogical reasoning; violation of relevancy by irrelevant answers and their flight of idea, and the violation of the manner maxim by the state of their participation in discourse, changing the subject or their voice and/or the style of the speaking within the discourse. The degree of incoherency (including cohesion aspects) was rated based on a scale of 1-4, and the relationship between the constant incoherency of speech and delusions was determined.

3. Results

3.1. The relationship between the types of delusions and hallucinations

Two types of delusions were identified: 1) A type which has an invariable theme, whether the story changes or not. 2) A type with variable themes and stories. We call them invariable delusion (ID) and variable delusion (VD) respectively. The speech of the former group was more coherent, whereas the latter group rambled and had incoherent speech. Their initial responses to the questions were relevant but soon became deviant switching to a different story. They sometimes uttered "yes" or "no" without being asked a question by the interviewer, and made up another story as if they were talking to somebody else. It was found that there is a relationship between these delusions and two types of hallucinations. The patients having ID had an experience of a previous hallucination which their delusions were based on, but those with VD, whether having a previous hallucination or not, seemed to have a simultaneous hallucination. We called the former, diachronic hallucination (DH) and the latter synchronic hallucination (SH). The 18 schizophrenics were classified into their delusion and hallucination status represented in table 2.

Table 2. Distribution of Subjects According to Both Their delusion And Hallucination Status (N=18)

Delusions →		**VD**		**ID**	
↓ Hallucinations		+	-	+	-
SH	+	11	1	8	4
	-	1	5	5	1
Total		18		18	
DH	+	4	4	8	0
	-	8	2	5	5
Total		18		18	

Investigations into the relationship between the variables of hallucinations and delusions reveal the following results:

- The high rate of chi-square (X^2= 10.125) and the low rate of standard deviation ($p=0.001<0.005$) show the significant relationship between SH and VD. The correlation coefficient (75%) reveals their strong relationship.

Figure 1 shows that the subjects with both SH and VD are the most numerous group (61/11%). Those with SH but without VD, similar to those with VD but without SH, comprise 5.56% of the total number of the patients. The schizophrenics who have neither SH nor VD constitute 27.78% of the total.

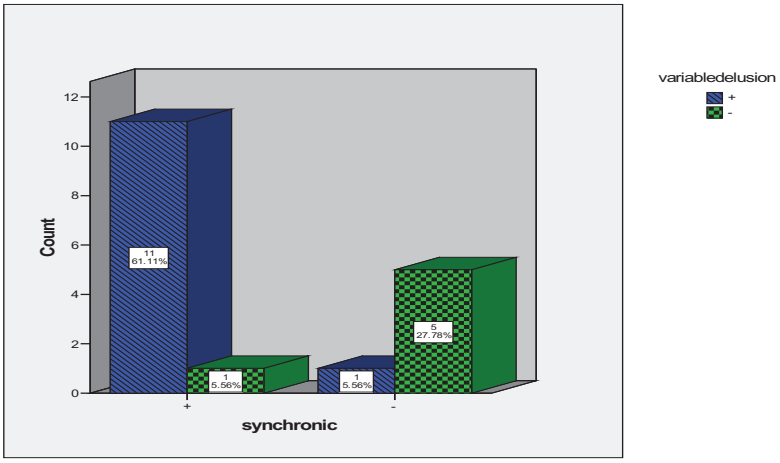

Figure1. The Relationship between SH and VD in Positive Schizophrenic Patients

- The low amount of chi-square (X^2= 1.8) and the high amount of standard deviation (p=0.18>0.005) show a very weak relation between DH and VD (about 31% correlation coefficient). Figure 2 shows the subjects with DH, either with or without VD, each comprise 22.22%, whereas those without DH and VD are only 11% of total. The percentage of those with VD but without DH is 44.44%, which indicates that there is a high degree of relation between these two variables.

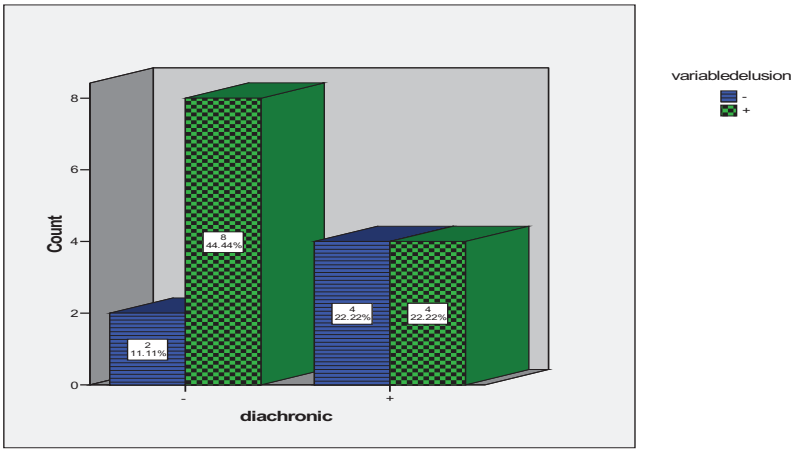

Figure 2. The Relationship between DH and VD in Positive Schizophrenic Patients

- The high rate of X^2 (= 5.538) and low rate of p (0.019< 0.005) show the significant correlation between DH and ID. Its correlation coefficient is 55%. Figure 3 indicates that the amount of the patients who have both DH and ID is high and compose 44.44% of total, whereas there is no patient with DH but without ID.

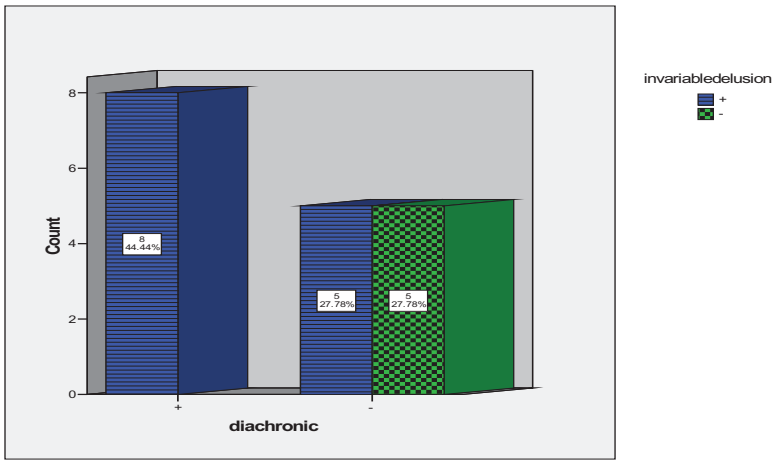

Figure 3. The relationship between DH and ID in positive schizophrenic patients

- The low amount of X^2 (0.554) and the high amount of p (0.457> 0.005), show the relation between SH and ID. Also, the correlation coefficient (-0.175) indicates a very strong relationship between them. In chart 4, not only the numerous patients with both ID and SH are indicated, but also the small number of them having neither ID nor SH.

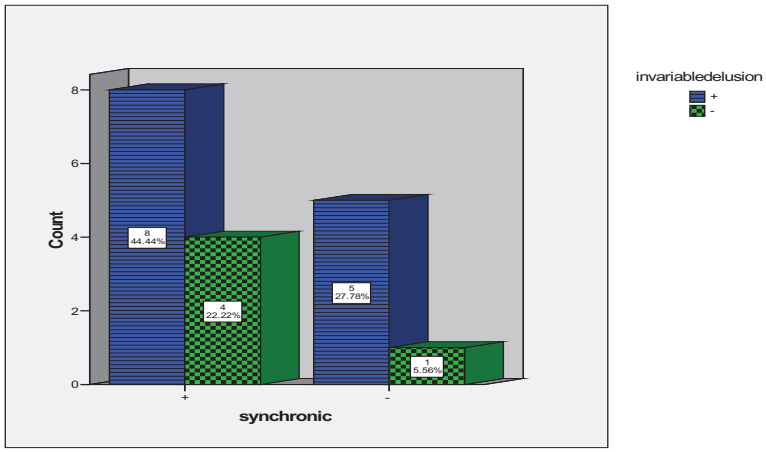

Figure 4. The Relationship Between SH and ID in Positive Schizophrenic Patients

3.2. The relationship between incoherency of speech and VD

According to the data, severe incoherency was seen far more in patients with VD as compare to those with ID. The status of the constant incoherency of speech in the subjects concerning to VD and ID is as follow:

Amongst the 18 positive schizophrenics, 7 patients had only ID, but none of them had severe or constant incoherency. Within all the subjects with VD (N=11), 6 patients had only VD and 5 patients had both of the delusions (VD and ID). Constancy of incoherency in these 11 subjects depends on the state of their delusion. A severe constant incoherency was noticed in the speech of all 6 patients who had only VD, but in 5 patients, who had both VD and ID, the severity of incoherency was not constant, and they returned more or less to the subject of discourse (Figure 5). Hence, the patients having VD, despite having ID or not, compose in sum 61.1% as opposed to the rest who have ID only.

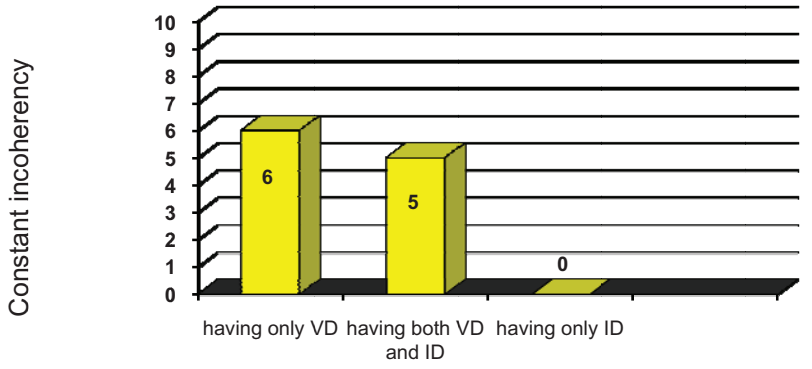

Figure 5. The Status of the Relation between Incoherency and Delusions in Positive Schizophrenic Patients

3. Discussion and conclusion

The relationship of TD as one of the three positive symptoms in schizophrenia with incoherency of speech has extensively been discussed in the literature (e.g., Byrne, Crowe, & Griffin, 1998; Fine, 1999; Rochester & Martin, 1979). The present study shows the relationship of two other positive symptoms, namely hallucination and delusion, with incoherency feature. Hallucinations which consistently suggest a specific matter to the patients (DH) are manifested in ID with invariable subjects, though in the form of different stories. Furthermore, delusions without any specific message but with various subjects (VD) have been found to be associated with SH, which may influence on the patients' performance simultaneously during a discourse. The results indicate that the speech of the patients having VD is completely vague. The findings of this part of our study conform to the findings of Bentall et al., (1991), Brebion et al., (2002, 2005), and Brunelin et al., (2008). Further investigations of the data reveal that each of the two types of delusions (ID and VD) manifests different types of incoherency. In VD, a severe and constant incoherency is seen, whereas in ID, incoherency is slight. The results also indicate that in these patients, incoherency of speech which occurs due to their VD is more severe and endures. No significant relation between ID and SH is found but it exists between ID and DH. Also, VD has a significant correlation with SH, whereas it does not have any relation with DH. There is a strong correlation between speech incoherency and VD in the patients.

Based on Frith (1992, 2005), Johnson et al., (1993), and Keefe et al., (1999) who believe that there is a relationship between hallucination and source memory, and according to Frith and Done (1998) who assume that a deficiency in corollary discharge networks leads to a deficit in self attributing process, we can suggest that the speech incoherency can be caused by a deficiency in the function of the corollary discharge networks. This deficiency gives rise to self-misattribution and consequently provokes the substitution of the mental addressee with the real one. This can explain the cause of incoherency of speech in schizophrenic patients who have SH and consequently VD. These patients may continue the discourse while substituting the real interlocutor with the mental one as a result of the deficiency in the corollary discharge. This explanation can be in line with Givon (1995) who suggests that coherency feature in mind and in context may not be coincided. In other words, the speech can be coherent in the patient's mind, but it may be incoherent contextually. Following the suggestions laid out in the majority of the studies (Frith, 2004; Brune, 2005; Abu-Akel, 1999, 2008; Bright-Paul et al., 2008), we can propose that incoherency of speech in schizophrenic patients can be explained as a deficit in the theory of mind.

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